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## The Doylestown algorithm- A test to improve the performance of AFP in the detection of Hepatocellular carcinoma

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**B**iomarkers for the early diagnosis of hepatocellular carcinoma (HCC) are needed to decrease mortality from this cancer. However, as new biomarkers were slow to come to clinical practice we have developed a system that uses clinical measurements commonly observed in those at risk of developing HCC and show that this procedure has improved performance over other biomarkers commonly used for the detection of HCC. Briefly, as alpha fetoprotein (AFP) is available and routinely used, an algorithm that incorporated AFP values along with 4 other clinical factors was developed in an attempt to improve the detection of HCC. Discovery analysis was performed on electronic data from patients who had liver disease (cirrhosis) alone or HCC in the background of cirrhosis. The discovery set consisted of 360 patients, 195 with liver cirrhosis and 165 with hepatocellular carcinoma, from two independent locations. A logistic regression algorithm was developed that incorporated log transformed AFP values along with age, gender, alkaline phosphatase and alanine aminotransferase levels. We define this as the Doylestown algorithm. In the discovery set, the application of the Doylestown algorithm improved the overall performance of AFP by 10%. In subsequent independent external validation in over 2,700 patients from 3 independent sites the Doylestown algorithm improved detection of HCC as compared to AFP alone by 4-20% as determined by AUROC. In addition, at a fixed specificity of 95%, the Doylestown algorithm improved the detection of HCC as compared to AFP alone by 2-20%. In conclusion, the Doylestown algorithm consolidates clinical laboratory values, with age and gender, which are each individually associated with HCC risk, into a single value that can be used for HCC risk assessment. As such, it should be applicable and useful to the medical community that manages those at risk for developing HCC.

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## Successful extracorporeal resuscitation after perioperative anaphylactic shock during living donor liver transplantation

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**A** 46-year-old dentist was admitted for emergent donor hepatectomy. His circulatory condition became unstable 75 minutes after induction and then deteriorated to ventricular fibrillation due to latex-induced anaphylaxis. Following 35 minutes of futile conventional resuscitation without spontaneous cardiac rhythm, extracorporeal resuscitation was initiated and electric cardiac activity returned 10 minutes later. He was discharged home without any sequelae. Few details are provided about the perioperative mortality but it seems that the surgical donation procedure was the main cause. Only one death was associated with anesthesia due to anaphylaxis. The most common agents of perioperative anaphylaxis are neuromuscular blocking drugs (60%) followed by latex (12-16%) and antibiotics (8%). For adult in-hospital cardiac arrest of cardiac origin, patients may benefit from extracorporeal life support with both short-term and long-term survival advantages compared with conventional cardiopulmonary resuscitation. Donor safety is extremely important. To rescue and resuscitate donor during the occurrence of crisis such as anaphylactic shock is important. More rapid response and more advanced procedure like extracorporeal life support should be applied as early as possible if initial conventional resuscitation fails. We hope that sharing our experience in this case will lead to better care of donors.

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